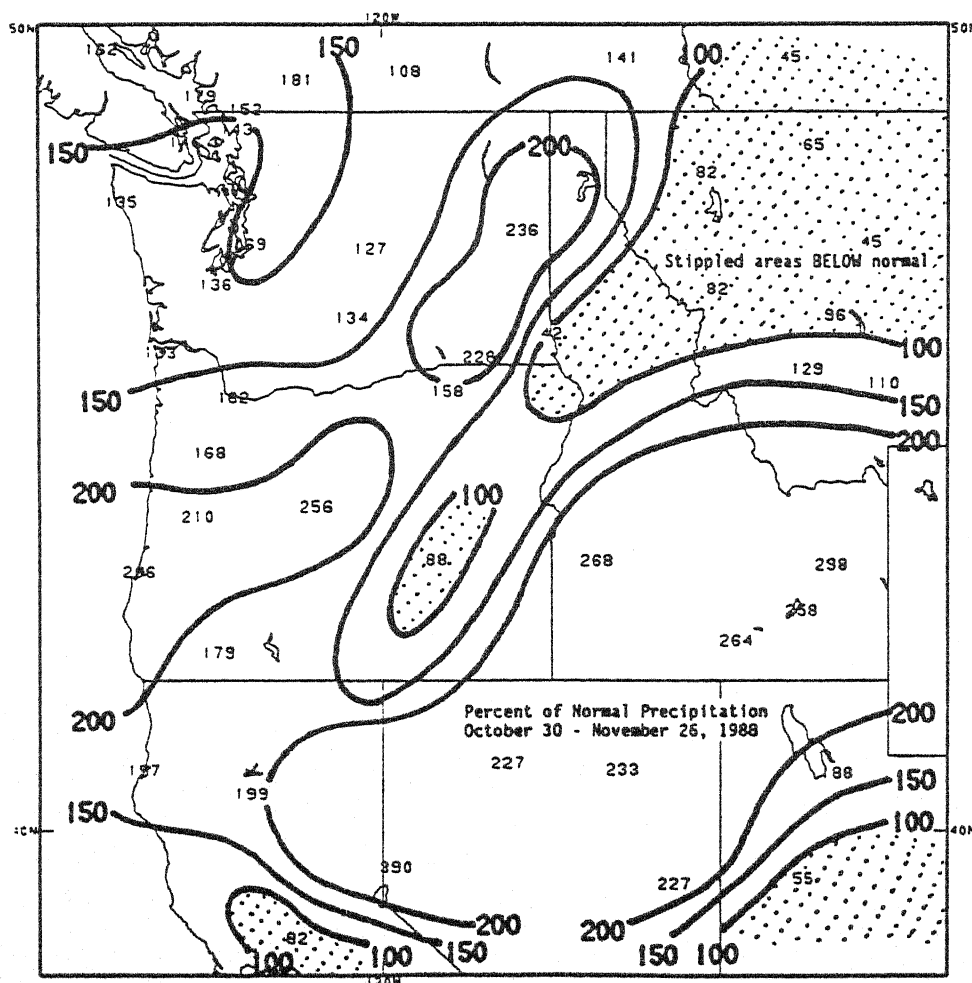


WEEKLY CLIMATE BULLETIN

No. 88/48

Washington, DC

November 26, 1988



AFTER MUCH OF THE PACIFIC NORTHWEST EXPERIENCED SUBNORMAL AUTUMN AND WINTER PRECIPITATION LAST YEAR, HEAVY PRECIPITATION DURING THE PAST FOUR WEEKS HAS GOTTEN THIS YEAR'S RAINY SEASON (NOV-MAR) OFF TO A GOOD START.

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE - NATIONAL METEOROLOGICAL CENTER

WEEKLY CLIMATE BULLETIN

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This Bulletin is issued weekly by the Climate Analysis Center and is designed to indicate, in a brief, concise format, current surface climatic conditions in the United States and around the world. The Bulletin contains:

- Highlights of major global climatic events and anomalies.
- U.S. climatic conditions for the previous week.
- U.S. apparent temperatures (summer) or wind chill (winter).
- Global two-week temperature anomalies.
- Global four-week precipitation anomalies.
- Global monthly temperature and precipitation anomalies.
- Global three-month precipitation anomalies (once a month).
- Global twelve-month precipitation anomalies (every 3 months).
- Global temperature anomalies for winter and summer seasons.
- Special climate summaries, explanations, etc. (as appropriate).

Most analyses contained in this Bulletin are based on preliminary, unchecked data received at the Center via the Global Telecommunication System. Similar analyses based on final, checked data are likely to differ to some extent from those presented here.

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GLOBAL CLIMATE HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF NOVEMBER 26, 1988

(Approximate duration of anomalies is in brackets)

1. Central United States:

UNUSUALLY WET CONDITIONS DEVELOP.

Moderate to heavy rain, as much as 162.6 mm (6.40 inches), fell in the central United States as storm systems moved across the Nation [4 weeks].

2. Argentina:

BELOW NORMAL PRECIPITATION PERSISTS.

Little or no precipitation was observed at most stations in northern Argentina as dry conditions continued [22 weeks].

3. Spain and Portugal:

WARM SPELL ENDS.

Temperatures were as much as 5.2°C (9.4°F) below normal as unseasonably warm conditions ended [Ended at 7 weeks].

4. Eastern Europe:

UNUSUALLY LOW TEMPERATURES OCCUR.

Unseasonably cold conditions were reported in much of eastern Europe from southern Sweden to Greece. Temperatures were as much as 15.2°C (27.4°F) below normal [5 weeks]. Winter storms brought heavy snows to parts of West Germany and the Alps [Episodic Events].

5. Eastern Asia:

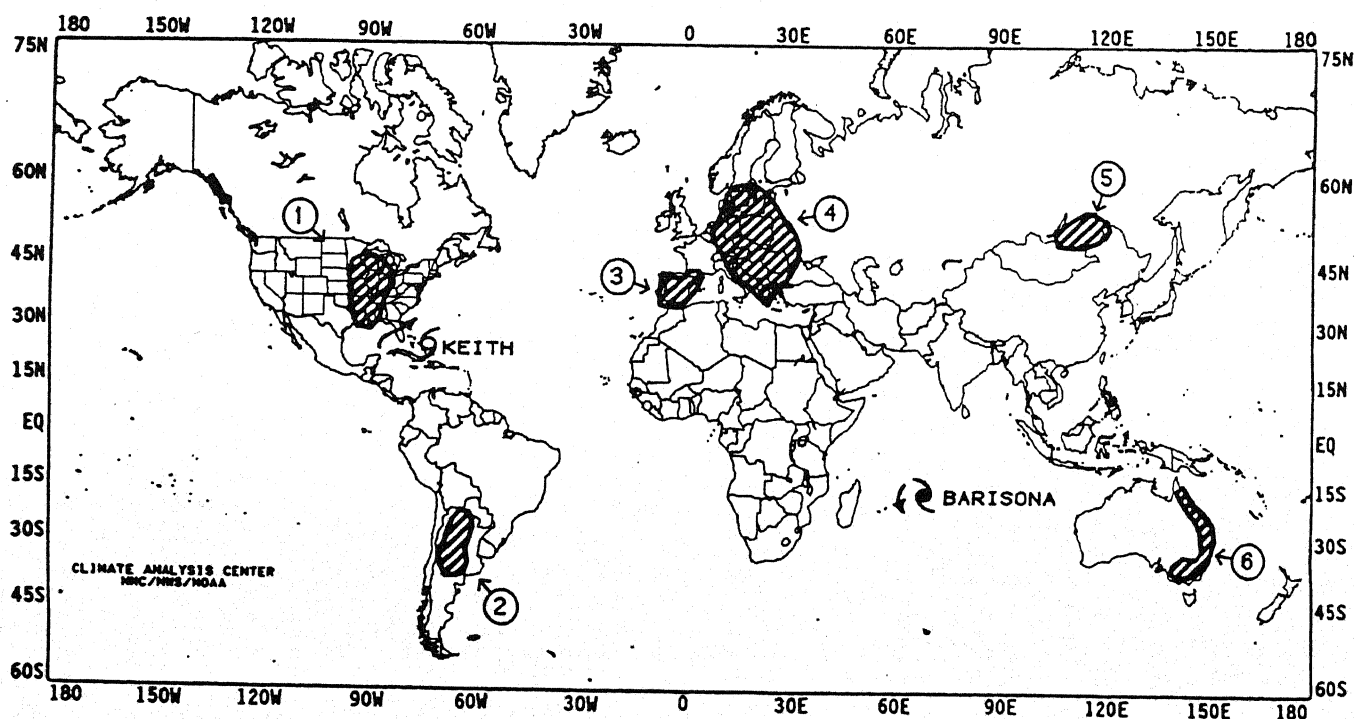
WARM CONDITIONS REMAIN.

A late season warm spell, with temperatures as much as 13.8°C (24.8°F) above normal, persisted in southeastern Siberia [7 weeks].

6. Australia:

RAINS END DRYNESS.

As much as 160.0 mm (6.30 inches) of precipitation ended the anomalously dry conditions in eastern Australia. Parts of the coasts of Queensland and Victoria were abnormally wet [Ended at 6 weeks].



Approximate locations of the major anomalies and events described above are shown on this map. See other maps in this Bulletin for current two week temperature anomalies, four week precipitation anomalies, longer term anomalies, and other details.

UNITED STATES WEEKLY CLIMATE HIGHLIGHTS

FOR THE WEEK OF NOVEMBER 20 THROUGH NOVEMBER 26, 1988.

For the third and fourth consecutive weeks, heavy precipitation was recorded throughout most of the Mississippi and Tennessee Valleys and along much of the Pacific Northwest Coast, respectively (see Table 1). In the Far West, another strong Pacific storm system dumped between 3 and 6 inches of rain along the coasts of Washington, Oregon, and northern California, while farther inland, between 6 and 12 inches of precipitation were measured in portions of Oregon's Cascade Range and California's Sierra Nevada Mountains, according to the River Forecast Centers. In contrast to last year's subnormal autumn and winter precipitation and an extremely dry October this year, excessive precipitation during the past 4 weeks (up to 30.5 inches) has gotten the Pacific Northwest's 1988-1989 rainy season (Nov-Mar) off to a good start (see front cover, Figures 1 and 2). The system also dropped moderate to heavy precipitation on parts of Idaho, western Montana, western Wyoming, northern Utah, and central Colorado. As the week progressed, the same storm system intensified over the nation's midsection and triggered heavy showers and thunderstorms in the lower Mississippi and Tennessee Valleys (up to 6.4 inches in southwestern Arkansas). Torrential rainfall during the past three weeks (up to 14.8 inches in central Arkansas) has provided significant relief from long-term precipitation deficits accumulated during this year's drought in much of the lower and middle Mississippi and Tennessee Valleys (see Figures 3 and 4). Farther east, moderate to heavy rains fell from southern Pennsylvania northeastward to Massachusetts. Tropical Storm Keith raced across Florida as the unusually late season

storm made landfall near Tampa Bay early Wednesday morning and brought inundating rains and gusty winds to the central part of the state. Elsewhere, heavy precipitation occurred in sections of south-central Alaska and the Hawaiian Islands. Light to moderate precipitation amounts were observed along the Pacific Coast, in most of the Great Basin, the interior of the Pacific Northwest, the northern Rockies, central Arizona, the central Great Plains, and throughout most of the eastern half of the country. Little or no precipitation fell on the desert Southwest, the central Rockies, the northern and southern thirds of the Great Plains, and along portions of the western Gulf Coast.

Temperatures averaged above normal throughout most of the nation last week with the exception of the Southwest. The greatest positive departures (between +5° and +7°F) were observed in the western Great Lakes, the Ohio and Tennessee Valleys, the southern Piedmonts, Florida, and at scattered stations in the northern Rockies and the northern Great Plains (see Table 2). Readings in the eighties were found from Florida northward to Cape Hatteras, NC, while temperatures in the seventies reached as far north as Delaware, West Virginia, and South Dakota. In the contiguous United States, slightly below normal temperatures prevailed in southern California, the southern halves of the Intermountain Region and Rockies, central Oklahoma, and western New England. Bitterly frigid Arctic air persisted over Alaska as departures averaged between 10° and 20°F below normal in the western and northern parts of the state (see Table 3).

TABLE 1. Selected stations with more than two and one-half inches of precipitation for the week.

<u>Station</u>	<u>Amount(In)</u>	<u>Station</u>	<u>Amount(In)</u>
Hilo/Lyman, Hawaii, HI	7.63	Quillayute, WA	3.64
Yakutat, AK	6.37	Eureka, CA	3.22
Daytona Beach, FL	5.86	Tuscaloosa, AL	3.13
Cape Canaveral AFS, FL	5.73	Memphis, TN	3.01
North Bend, OR	5.61	New York/La Guardia, NY	2.91
Redding, CA	5.14	Hartford, CT	2.90
Tampa, FL	4.56	Olympia, WA	2.84
Eugene, OR	4.39	Little Rock AFB, AR	2.75
Marysville/Beale AFB, CA	4.26	Medford, OR	2.65
Orlando, FL	4.13	Portland, OR	2.62
Astoria, OR	4.07	Jackson, TN	2.56
Tampa/Mac Dill AFB, FL	4.06	Newark, NJ	2.54
Salem, OR	3.84	Providence, RI	2.52

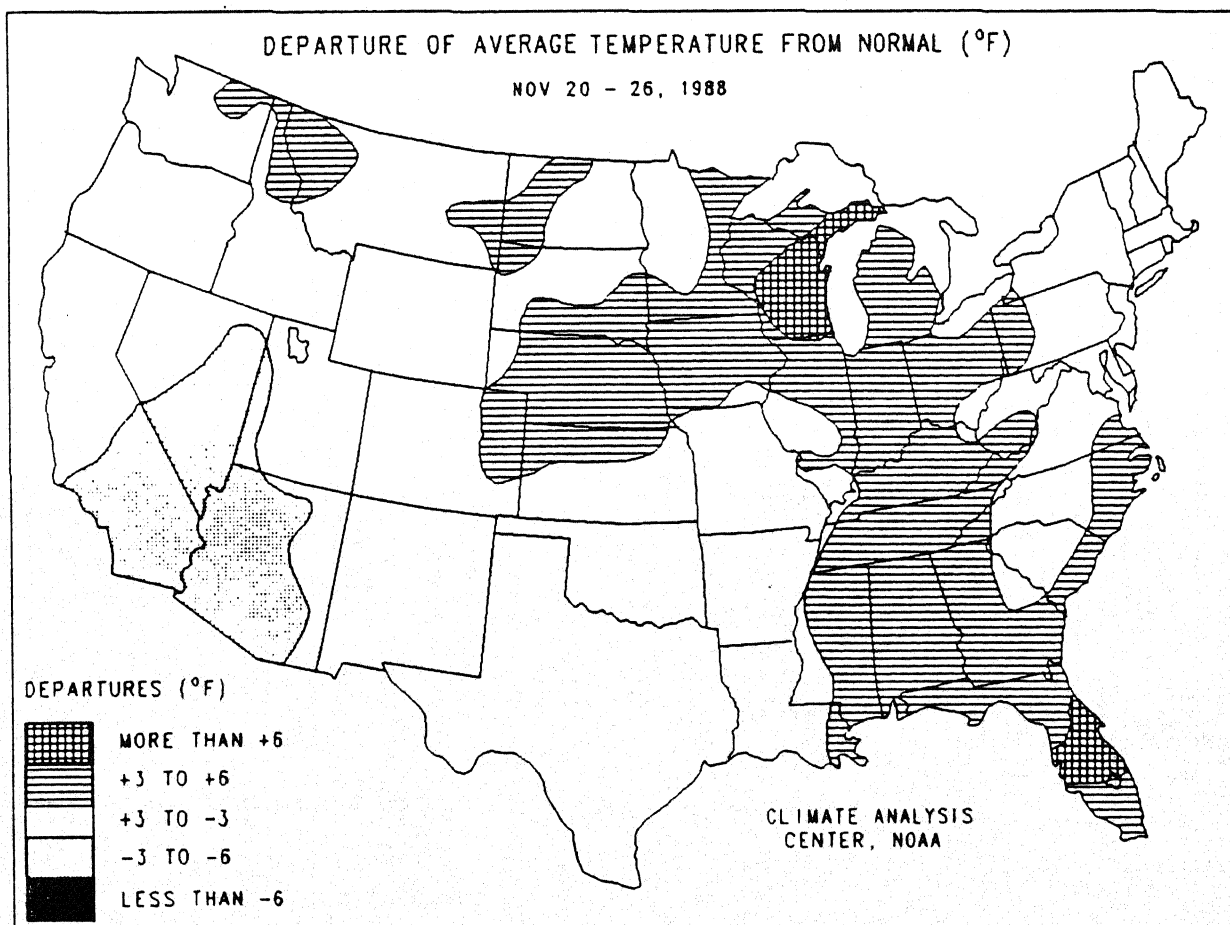
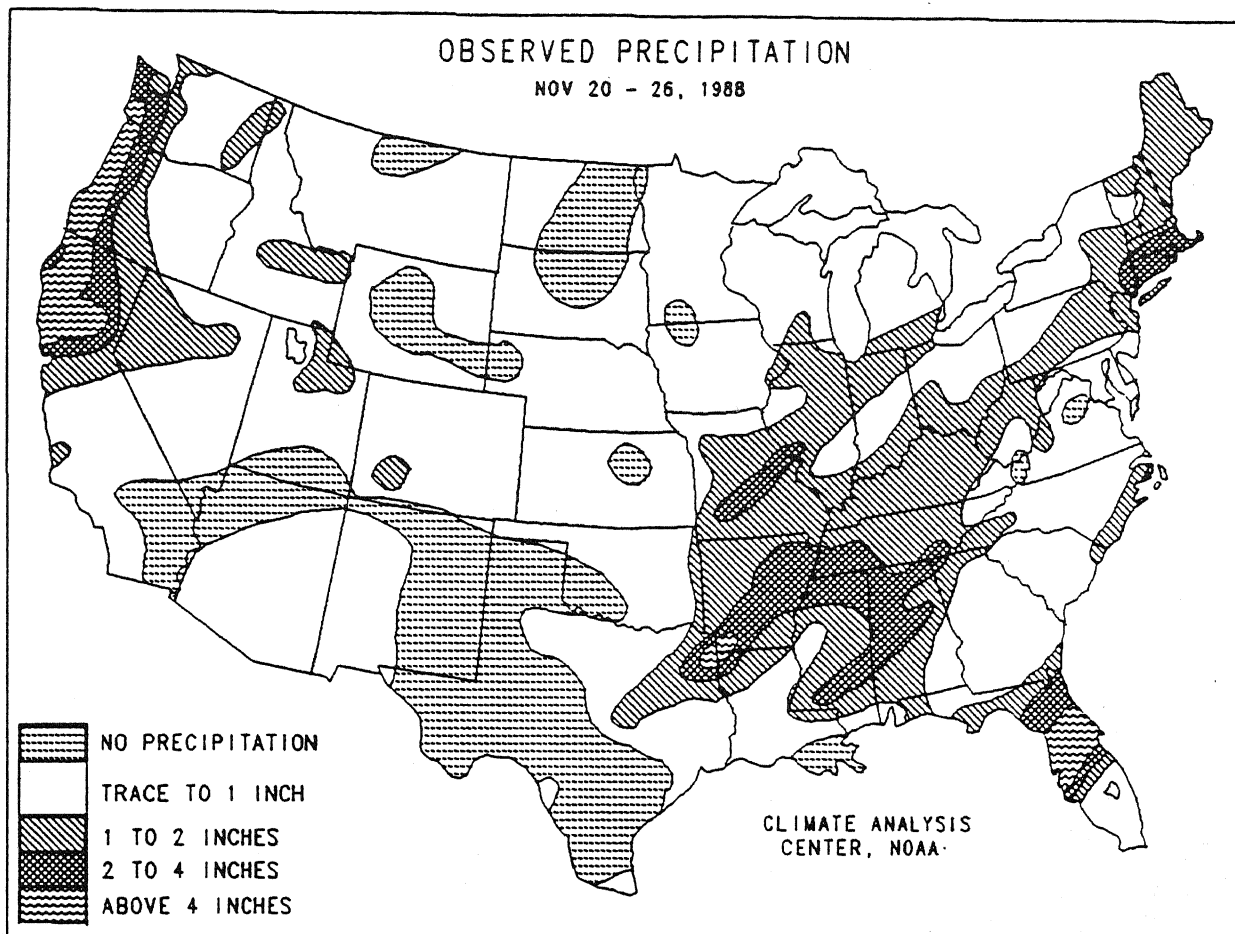


TABLE 2. Selected stations with temperatures averaging 5.0°F or more ABOVE normal for the week.

<u>Station</u>	<u>TDepNm1</u>	<u>AvgT(°F)</u>	<u>Station</u>	<u>TDepNm1</u>	<u>AvgT(°F)</u>
Sault Ste. Marie, MI	+8.5	37.3	Houghton Lake, MI	+5.6	36.8
Vero Beach, FL	+7.4	74.5	Miami, FL	+5.5	76.9
Green Bay, WI	+7.3	37.3	West Palm Beach, FL	+5.5	75.6
Madison, WI	+7.0	38.3	Chicago/O'Hare, IL	+5.5	41.9
Milwaukee, WI	+6.5	40.2	North Platte, NE	+5.5	36.9
Daytona Beach, FL	+6.4	69.5	Valentine, NE	+5.5	35.7
Pellston, MI	+6.4	37.3	Missoula, MT	+5.5	34.7
Eau Claire, WI	+6.4	33.9	Fort Myers, FL	+5.4	73.4
Wausau, WI	+6.3	33.9	Jacksonville, FL	+5.4	64.9
Tampa, FL	+6.2	70.9	Cape Hatteras, NC	+5.4	59.3
Orlando, FL	+6.0	71.1	Anniston, AL	+5.4	54.9
South Bend, IN	+6.0	42.7	Norfolk, NE	+5.4	37.2
Dickinson, ND	+6.0	31.2	Lansing, MI	+5.3	40.4
Valparaiso/Eglin AFB, FL	+5.9	61.8	Kalispell, MT	+5.3	34.0
Tuscaloosa, AL	+5.8	56.1	Huntsville, AL	+5.2	53.1
Crossville, TN	+5.8	48.1	Cincinnati, OH	+5.1	45.4
Escanaba, MI	+5.8	37.0	Alpena, MI	+5.1	37.1
Marquette, MI	+5.8	31.9	Beeville NAS, TX	+5.0	65.4
Nashville, TN	+5.7	51.5	Columbus, GA	+5.0	57.4
Jackson, KY	+5.7	49.5	Atlanta, GA	+5.0	54.4
Rockford, IL	+5.7	39.2	Sioux Falls, SD	+5.0	33.4
Grand Rapids, MI	+5.6	40.9	Park Falls, WI	+5.0	30.4
Flint, MI	+5.6	40.8			

TABLE 3. Selected stations with temperatures averaging more than 5.0°F BELOW normal for the week.

<u>Station</u>	<u>TDepNm1</u>	<u>AvgT(°F)</u>
Barter Island, AK	-24.5	-28.2
King Salmon, AK	-20.7	-0.7
Bethel, AK	-16.6	-2.6
Barrow, AK	-14.7	-19.6
Nome, AK	-13.6	-0.9
Unalakleet, AK	-12.5	-2.8
Iliamna, AK	-10.5	9.8
St. Paul Island, AK	- 9.0	23.2
Kotzebue, AK	- 8.9	-4.5
Cold Bay, AK	- 8.3	24.6
Kodiak, AK	- 7.8	25.7
Homer, AK	- 7.4	19.4
Big Delta, AK	- 6.4	-2.8
Talkeetna, AK	- 6.0	8.5
Bettles, AK	- 5.6	-8.7
McGrath, AK	- 5.3	-4.7
Redding, CA	- 5.3	45.6

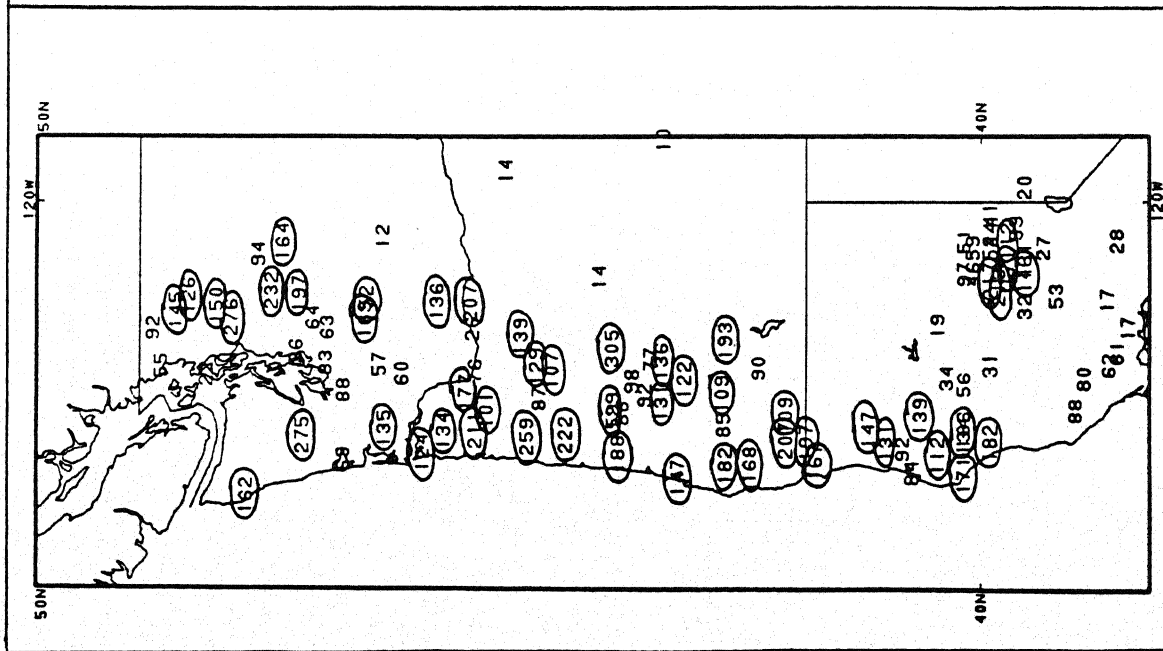


Figure 1. Total precipitation (inches) during Oct. 30 - Nov. 26, 1988. Station values are plotted in tenths of inches (e.g. 147 = 14.7"), and circled amounts are greater than 10 inches. Excessive precipitation (up to 30.5 inches) has fallen on many coastal and mountainous stations in the western portions of Washington, Oregon, and northern California during the past 4 weeks.

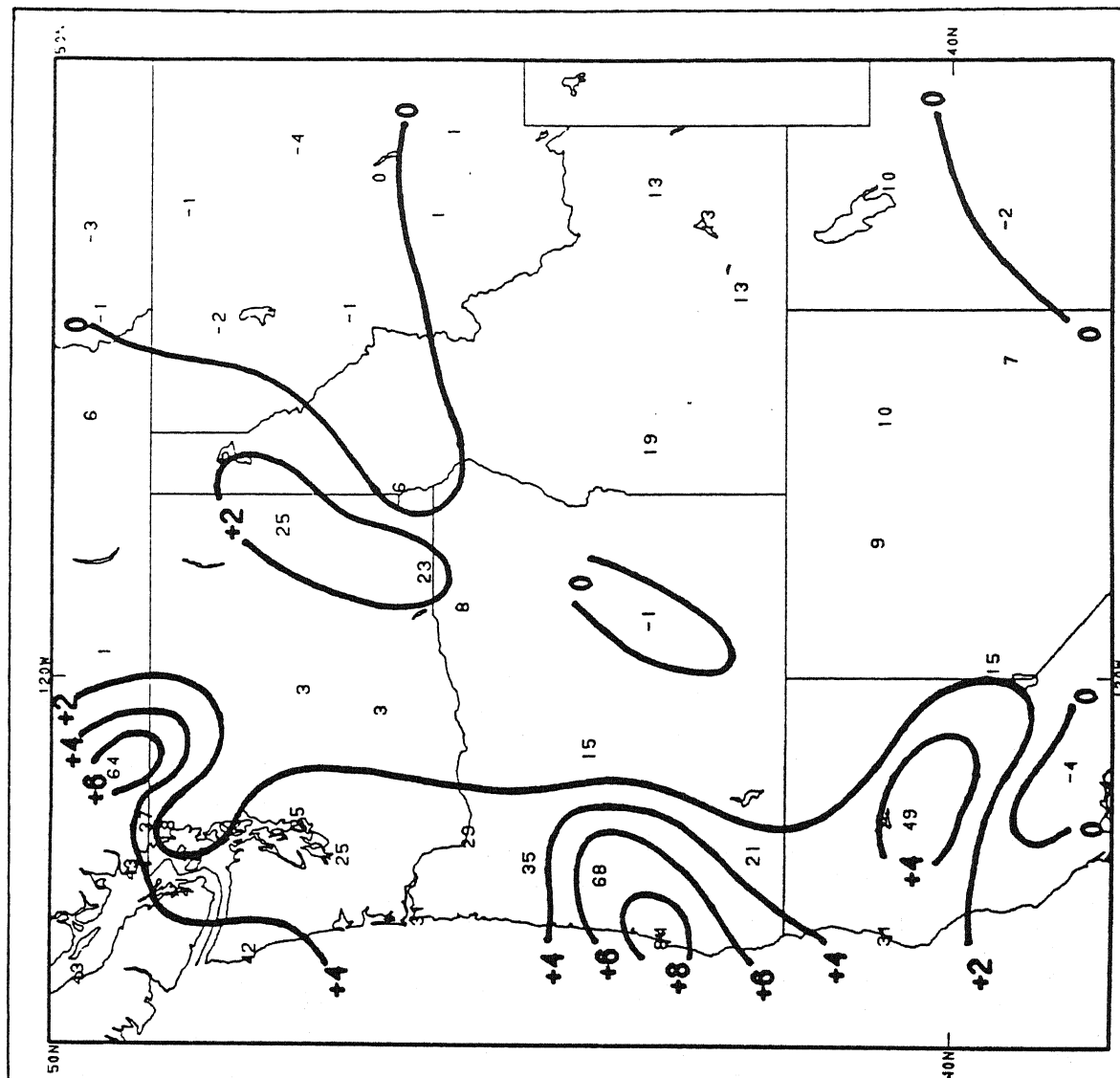


Figure 2. Departure from normal precipitation (inches) during Oct. 30 - Nov. 26, 1988. Station values are plotted in tenths of inches (e.g. 29 = 2.9"), and isopleths are drawn for every two inches. Since October 30, stations along the Pacific Northwest Coast have measured more than 2 inches of surplus precipitation.

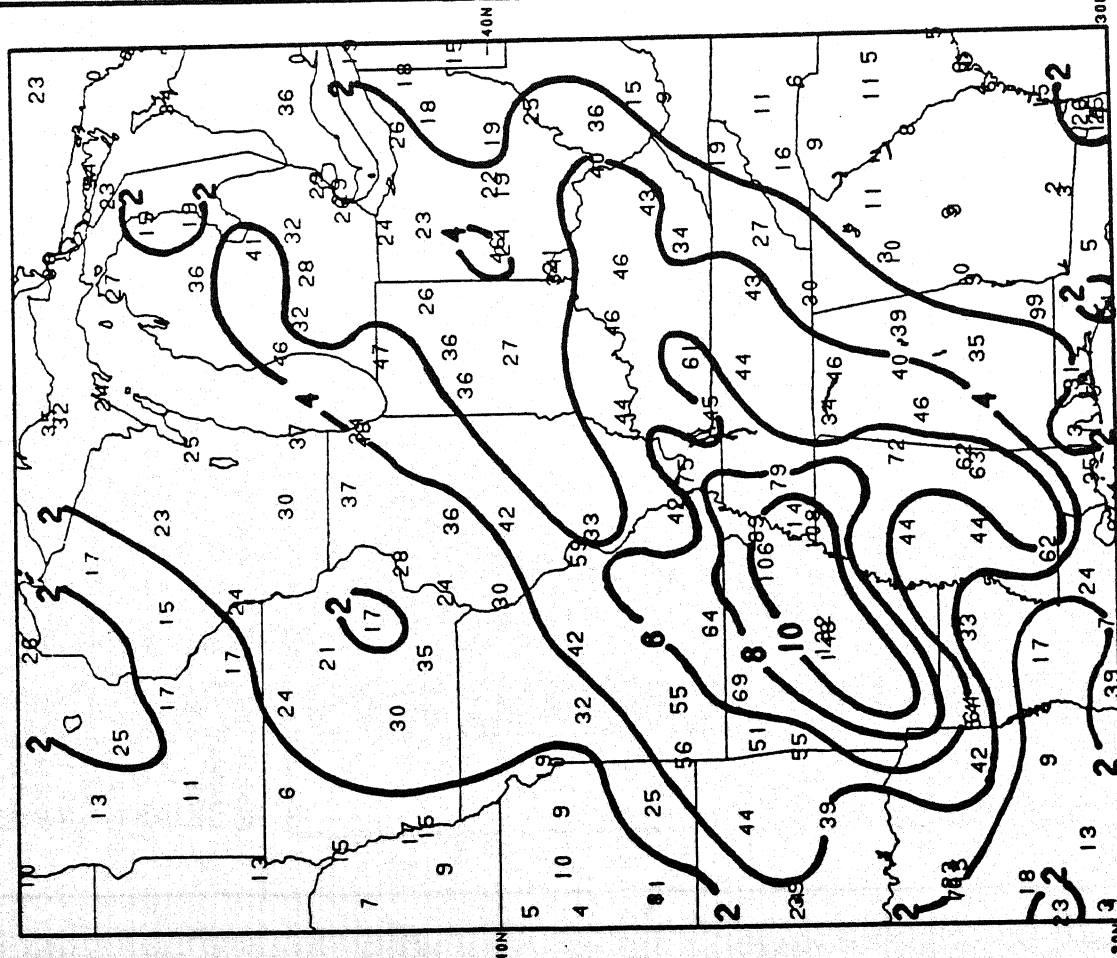


Figure 3. Total precipitation (inches) during Nov. 6-26, 1988. Station values are plotted in tenths of inches (e.g. 64 = 6.4"), and isopleths are drawn for every two inches up to 10 inches. Strong thunderstorms have dumped copious amounts of rain (up to 18 inches) on much of the lower Mississippi Valley during the past 3 weeks.

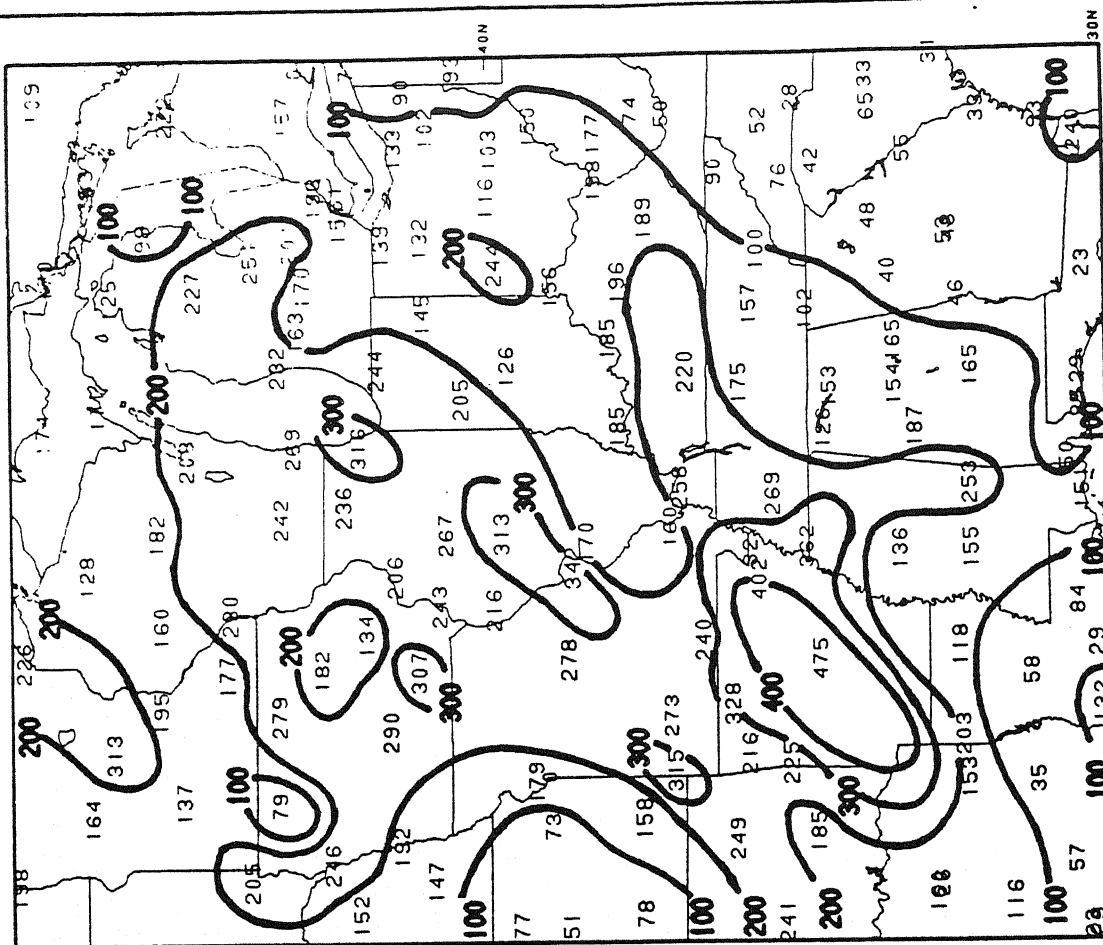
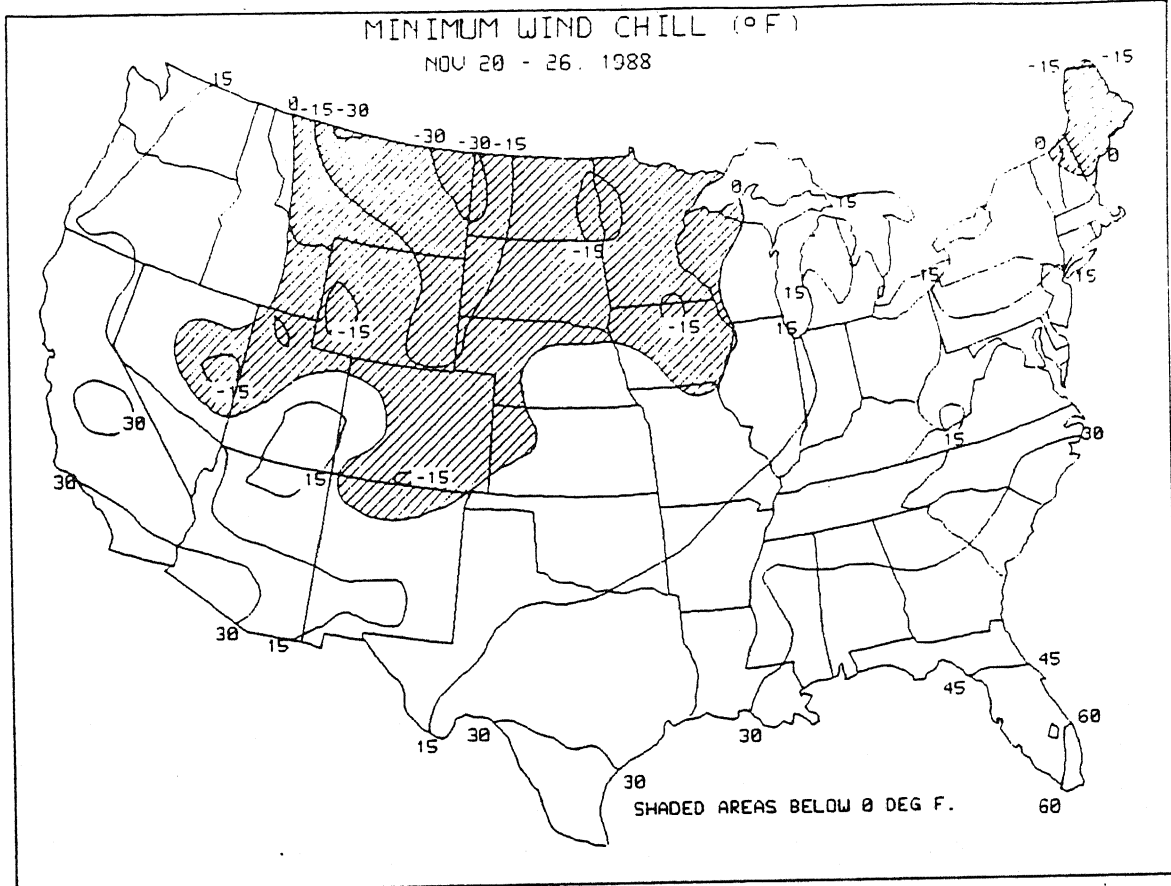
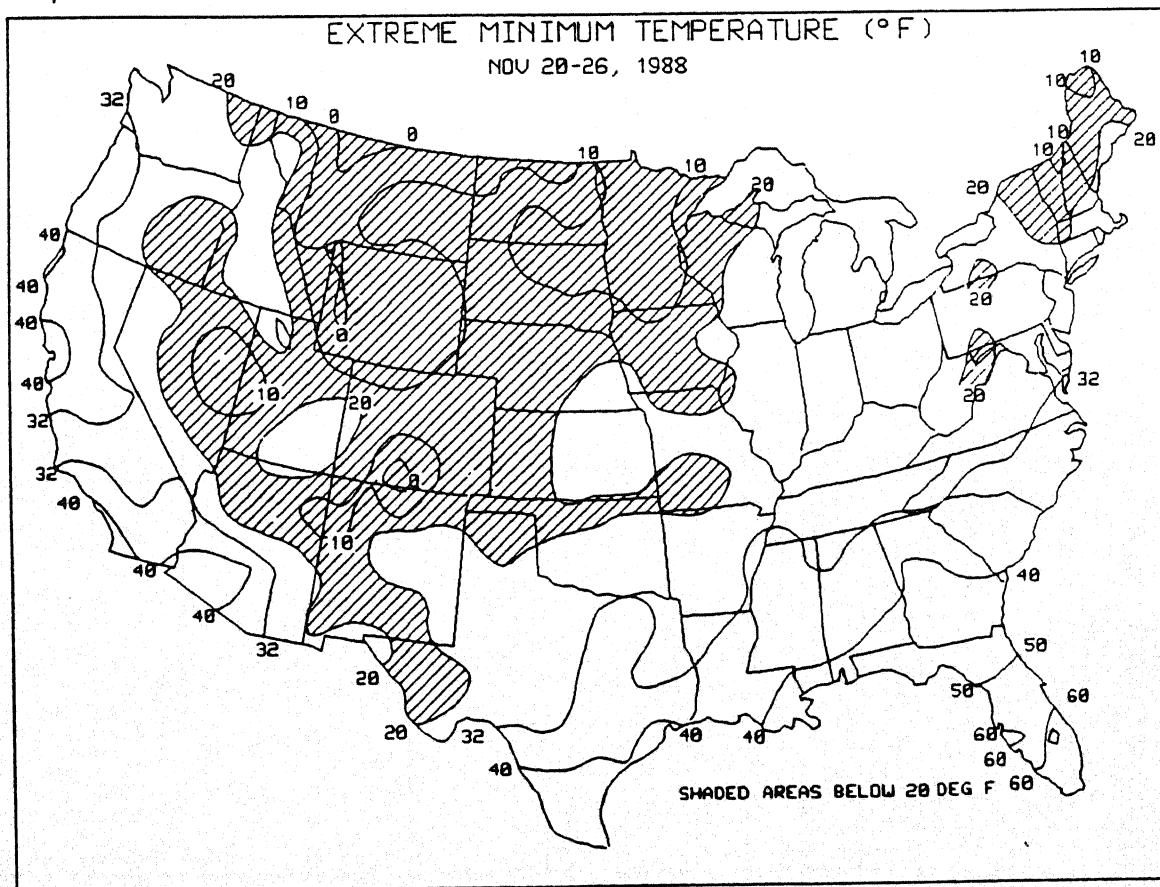
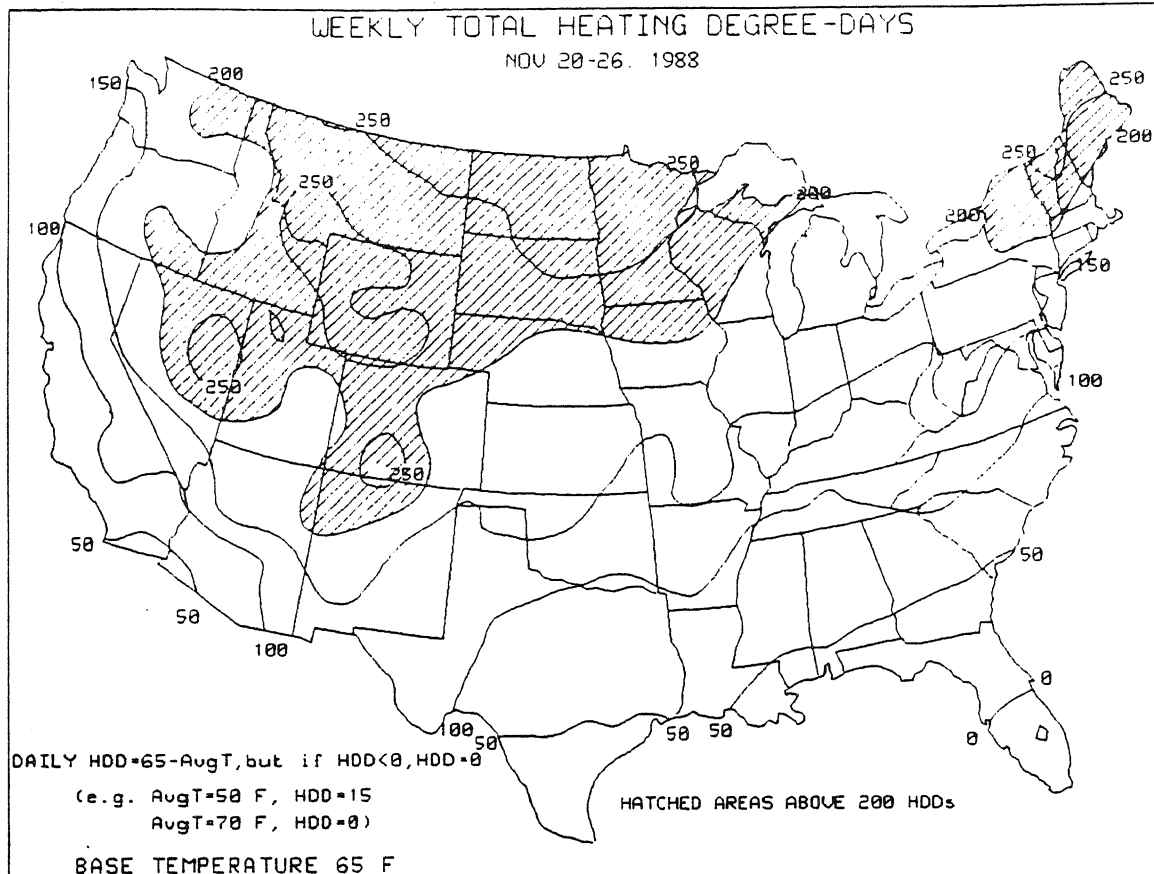


Figure 4. Percentage of normal precipitation during Nov. 6-26, 1988. Isohyets are drawn for every 100%. Since November 6, much above normal precipitation has provided significant relief from long-term precipitation deficits in the Mississippi, Tennessee, and Ohio Valleys.

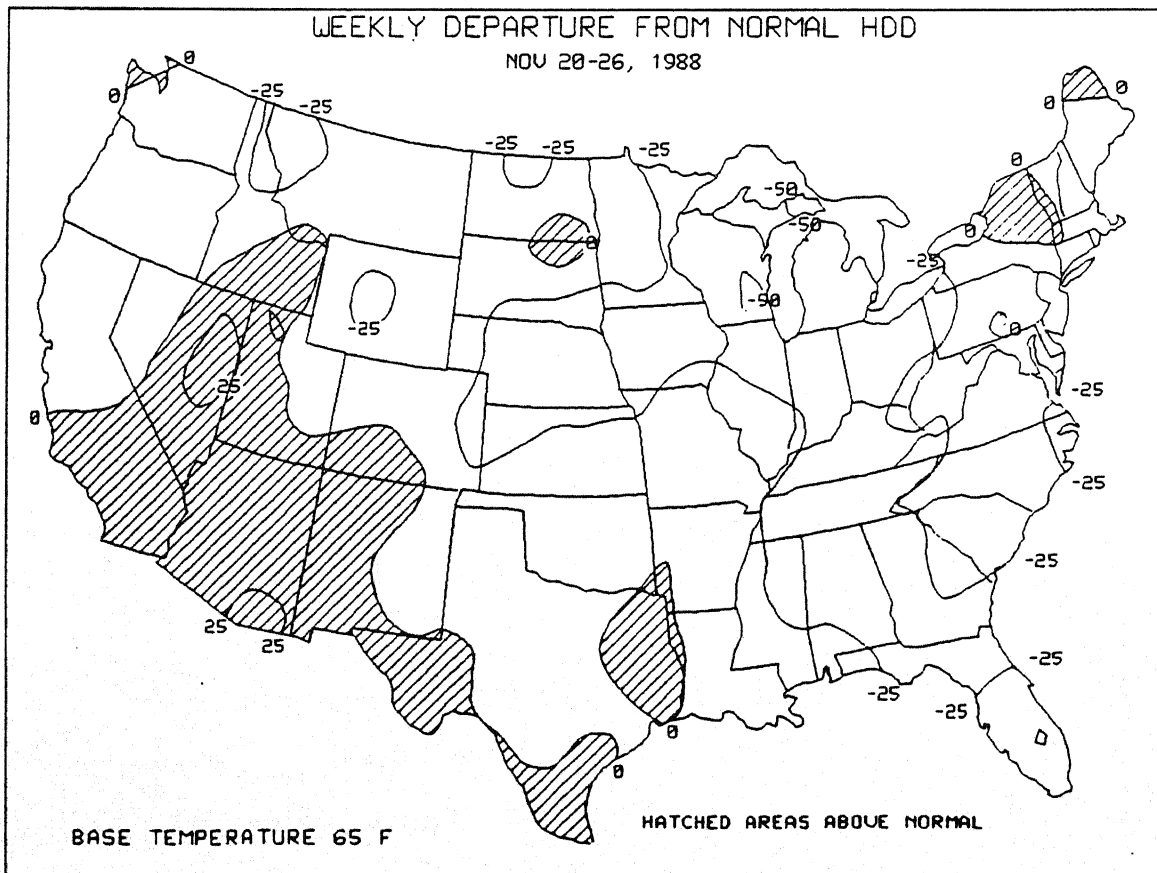


An intense storm system in the nation's midsection brought low temperatures and strong winds to Montana, Wyoming, and the Dakotas as wind chills dipped below -15°F (top). Towards the end of the week, frigid air replaced unseasonably mild conditions in the north-central U.S. as single digit temperatures were recorded in parts of the Rockies and Great Plains (bottom).



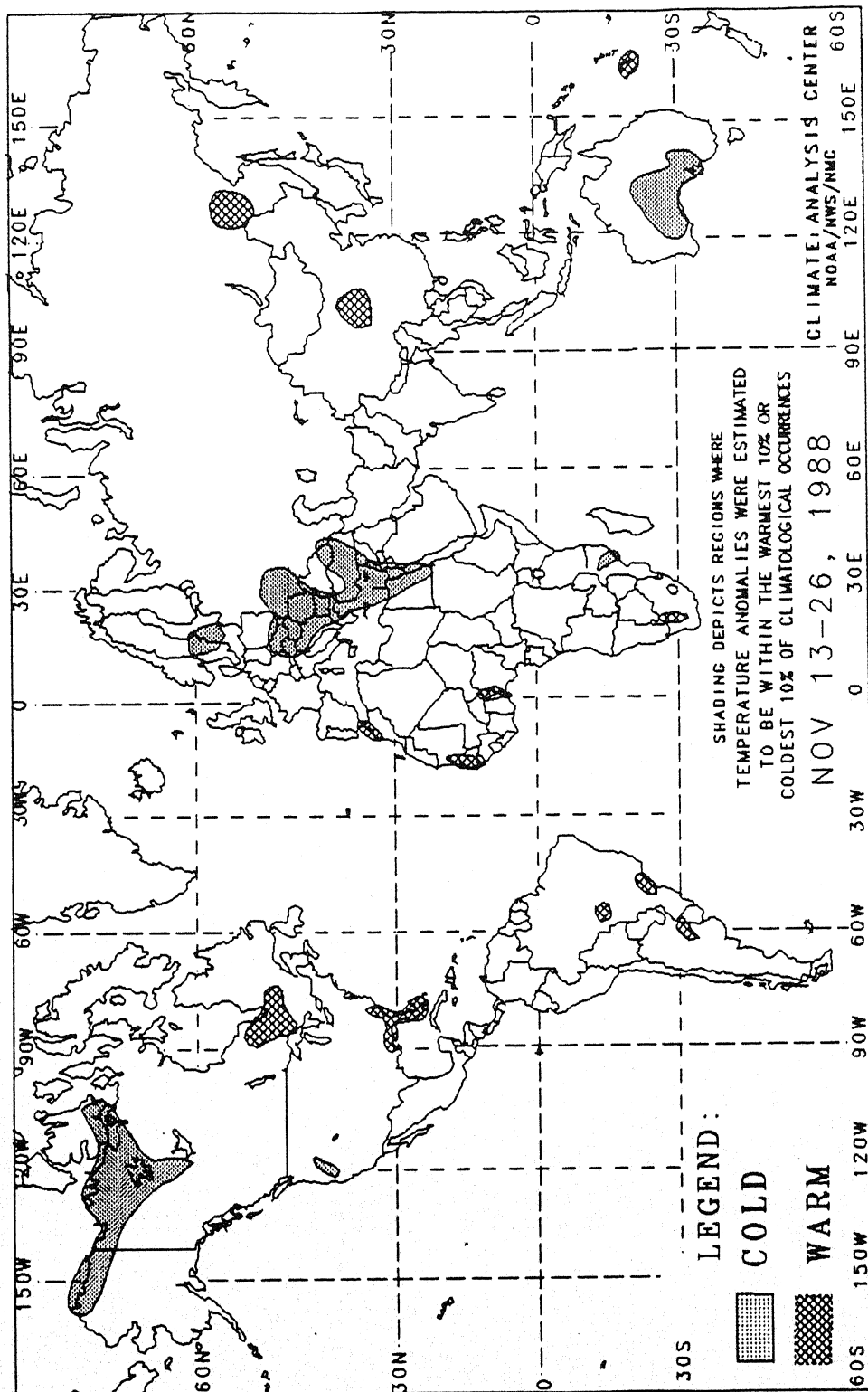


Greatest weekly heating usage (more than 250 HDD) occurred in the northern thirds of the Rockies and Great Plains and in New England (top) as weekly heating demand was near or slightly below normal for most of the nation with the exception of the Southwest (bottom).



GLOBAL TEMPERATURE ANOMALIES

2 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 13 days of temperature observations were received from synoptic reports. Many stations do not operate on a twenty-four hour basis so many night time observations are not taken. As a result of these missing observations the estimated minimum temperature may have a warm bias. This in turn may have resulted in an overestimation of the extent of some warm anomalies.

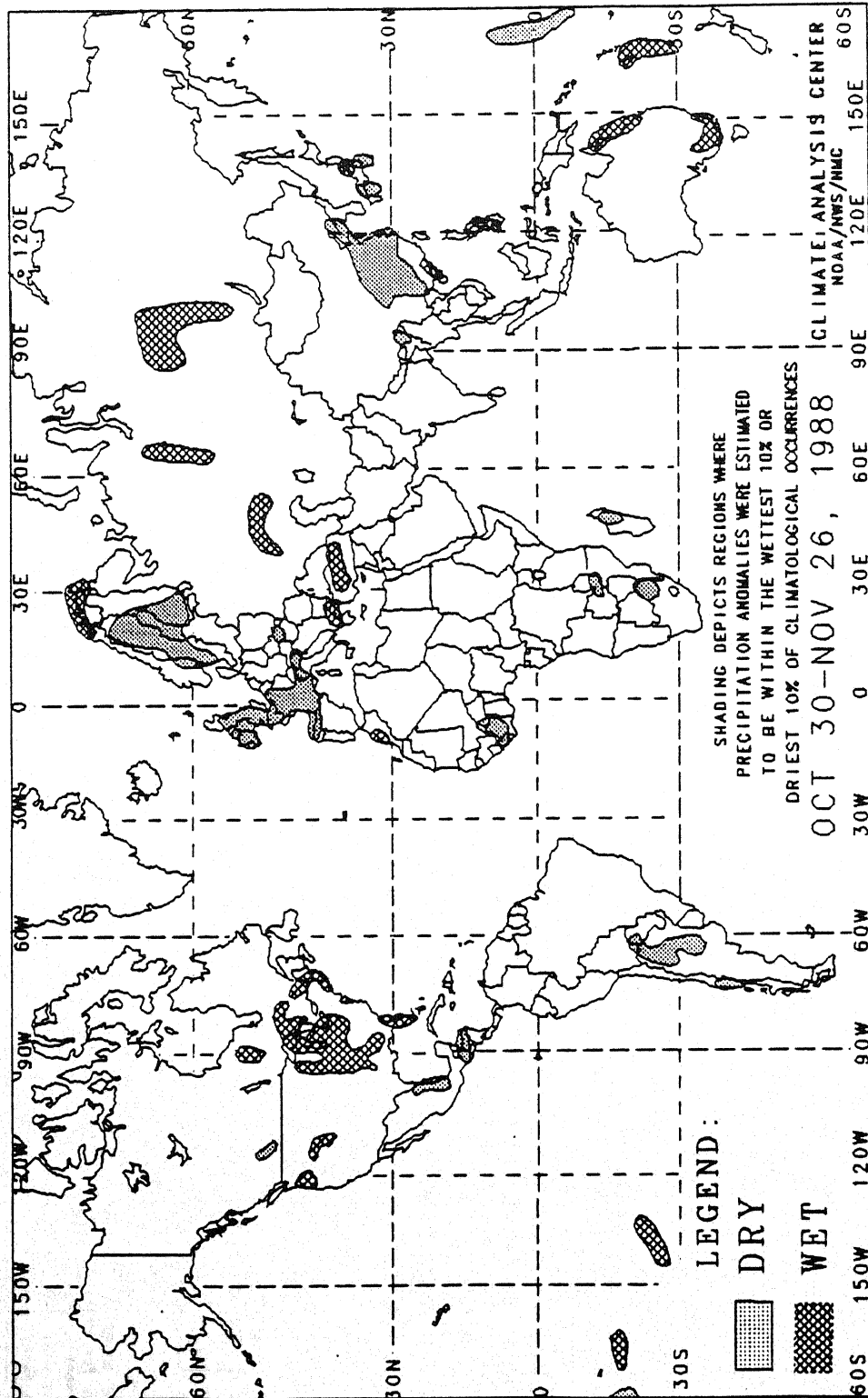
Temperature anomalies are not depicted unless the magnitude of temperature departures from normal exceeds 1.5°C.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of two week temperature anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

GLOBAL PRECIPITATION ANOMALIES

4 WEEKS



The anomalies on this chart are based on approximately 2500 observing stations for which at least 27 days of precipitation observations (including zero amounts) were received or estimated from synoptic reports. As a result of both missing observations and the use of estimates from synoptic reports (which are conservative), a dry bias in the total precipitation amount may exist for some stations used in this analysis. This in turn may have resulted in an overestimation of the extent of some dry anomalies.

In climatologically arid regions where normal precipitation for the four week period is less than 20 mm, dry anomalies are not depicted. Additionally, wet anomalies for such arid regions are not depicted unless the total four week precipitation exceeds 50 mm.

In some regions, insufficient data exist to determine the magnitude of anomalies. These regions are located in parts of tropical Africa, southwestern Asia, interior equatorial South America, and along the Arctic Coast. Either current data are too sparse or incomplete for analysis, or historical data is insufficient for determining percentiles, or both. No attempt has been made to estimate the magnitude of anomalies in such regions.

The chart shows general areas of four week precipitation anomalies. Caution must be used in relating it to local conditions, especially in mountainous regions.

